

active region as in the prior art described in FIG. 1. This case is represented by ● in the graph of FIG. 9. The two cases are represented by the numbers of accumulated failed cells according to refresh time.

B¹ cont

In addition, during channel ion-implantation, boron ions were implanted into a portion over which a gate electrode would be formed and into a portion where a source/drain region connected to a bit line contact would be formed in an active region at a dose of about $1.0E13/cm^2$ and with ion-implantation energy of about 30KeV in a first local ion-implantation step, and then boron difluoride ions were implanted into only the portion over which the gate electrode would be formed and the portion where the source/drain region connecting to the bit line contact would be formed in the active region at a dose of about $1.5E13/cm^2$ and with ion-implantation energy of about 30KeV in a second local ion-implantation process. This case is represented by -▽- in the graph of FIG. 9. In another case, dual channel ion-implantation was performed under the same conditions as the above case, but the channel ion-implantation was performed on an entire active region as in the prior art described in FIG. 1. This case is represented by ▼ in the graph of FIG. 9. The two cases are represented by the numbers of accumulated failed cells according to refresh time.--

In the Claims:

Please replace Claims 1-3 with the following like numbered claims:

- B² Sub C¹*
1. (Amended) A method of forming a channel region between isolation regions of an integrated circuit substrate, the method comprising:
forming a mask on the isolation region that extends onto a portion of the substrate adjacent to the isolation region to provide a shielded portion of the substrate adjacent to the isolation region and an exposed portion of the substrate spaced apart from the isolation region having the shielded portion therebetween;
forming a channel region in the exposed portion of the substrate;
forming a plurality of gate electrodes on the channel region; and

implanting ions using the plurality of gate electrodes as an implant mask to form source/drain regions associated with the plurality of gate electrodes and to define separate channel regions from the channel region that are self-aligned to the plurality of gate electrodes.

B²
cont
Sub
D¹

2. (Amended) A method according to Claim 1 wherein the forming the channel region comprises:

implanting a first concentration of ions in the shielded region adjacent to the isolation region; and

wherein the implanting ions comprises implanting a second concentration of ions in the channel region spaced apart from the isolation region, wherein the second concentration is greater than the first concentration.

3. (Amended) A method according to Claim 1 wherein the forming a channel region comprises implanting boron ions in the exposed portion.

Please cancel Claims 4-16 without prejudice or disclaimer.

Please add the following new Claims 17-23:

B³
Sub
D¹

17. (New) A method according to Claim 1 wherein at least one of the source/drain regions is in the exposed portion.

18. (New) A method according to Claim 1 wherein the implanting ions comprises:

implanting first ions of first conductive type; and

implanting second ions of second conductive type.

19. (New) A method according to Claim 18 wherein the implanting first ions and second ions comprises:

Sub D1
implanting boron ions to provide a first concentration of ions of about 1×10^{17} ions/cm³.

20. (New) A method according to Claim 1 wherein the source/drain regions comprise lightly doped source/drain structures.

B₃ Sub C2
21. (New) A method of forming a channel region between isolation regions of an integrated circuit substrate, the method comprising:

forming a mask on first and second adjacent isolation regions in an integrated circuit substrate and extending onto an active area between the first and second adjacent isolation regions to define first and second shielded portions of the substrate adjacent to the first and second isolation regions and an exposed portion of the substrate therebetween;

forming a single channel region in the exposed portion of the substrate;
forming a plurality of gate electrodes on the single channel region; and
implanting ions using the plurality of gate electrodes as an implant mask to form source/drain regions associated with the plurality of gate electrodes and to form first and second spaced apart channel regions from the single channel region.

Sub D1
22. (New) A method according to Claim 21 wherein the implanting ions comprises implanting ions to form the first and second spaced apart channel regions self-aligned to the plurality of gate electrodes.

23. (New) A method according to Claim 21 wherein forming a single channel region comprises implanting boron ions in the exposed portion.